Utility of Echocardiography for the Diagnosis of Right Atrial Dissection

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A 17-year-old girl presented with chief complaints of intermittent palpitations and chest tightness for 2 years. Transthoracic echocardiography revealed a large aneurysmal sac in the right atrium surrounded by a membrane-like structure, which compressed the tricuspid valve (Figure A,B; Supplementary Movie 1). Contrast echocardiography detected communication of the aneurysmal sac with the atrial true lumen (Figure C; Supplementary Movie 2). We diagnosed the membrane-like structure as right atrial (RA) dissection. Further inquiry with contrast-enhanced computed tomography (Figure D–F) and cardiac magnetic resonance imaging (Figure G) confirmed the diagnoses of RA dissection. The pre-bypass transesophageal echocardiography showed the size and location of the RA dissection (Figure H,I). Because of a concern of potential arrhythmias and thromboembolic complications, we recommended operative resection of the RA dissection. The aneurysmal sac was completely resected (Figure J,K), and the lateral wall of RA was reconstructed. Histological examination of the resected RA tissue was consistent with the diagnosis of RA dissection (Figure L).

To the best of our knowledge, left atrial dissection has been reported in a small number of patients, but cases of RA dissection are rare. This case highlights that echocardiography plays a key role in the accurate characterization of RA dissection.

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Supplementary Files

Supplementary Movie 1. Transthoracic echocardiography demonstrating right atrial dissection in the presence of giant right aneurysmal sac.

Supplementary Movie 2. Contrast Echocardiography showing microbubbles filling simultaneously the giant right aneurysmal sac and the atrial true lumen.

Please find supplementary file(s);
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Figure. Imaging for right atrium (RA) dissection. (A,B) Transthoracic echocardiography demonstrated RA dissection in the presence of a giant right aneurysmal sac (asterisk) surrounded by a membrane-like structure (yellow arrowheads) compressing the tricuspid valve (white arrow). LA, left atrium; LV, left ventricle; RV, right ventricle. (C) Contrast echocardiography showed microbubbles simultaneously filling the giant right aneurysmal sac (asterisk) and the atrial true lumen. (D–G) RA dissection was identified by contrast-enhanced computed tomography and magnetic resonance imaging. (H,I) Transesophageal echocardiography showed the size and location of the RA dissection. (J,K) Intraoperative images showing RA dissection and the giant right aneurysmal sac. (L) Histopathological analysis of the specimen revealed that the RA dissection was mainly composed of muscular elements.